Spectrum efficiency requirements for the Compromise Plan were obtained from the following sources:

Channel Bandwidth	Source
400 and 800 KHz	Alcatel Modified Plan
1.25, 2.5, and 3.75 MHz	Joint Commenter Plan

4.2 40 MHZ WIDEBAND CHANNELS

The Alcatel Modified Plan proposes a minimum payload capacity of 3 DS3's in 40 MHz for the spectrum efficiency requirement. The Joint Commenters propose a minimum capacity of 4 DS3's in 40 MHz.

The Compromise Plan specifies a minimum capacity of 3 DS3's in 40 MHz, as proposed in the Alcatel Modified Plan, for the following reason. Currently, there are two 40 MHz frequency plans in wide use: the DE Plan and the PJ Plan. Neither plan is dominant: the use of a particular plan depends on the precedent set by previous frequency coordination activity.

In the Compromise Plan, the DE Plan is used for the 40 MHz channel plan and the PJ Plan is used for the 30 MHz plan. In a geographic area using the DE Plan, 3 DS3 radios would be coordinated using the 40 MHz plan. In an area using the PJ Plan, 3 DS3 radios would be coordinated using the 30 MHz plan.

If a minimum payload capacity of 4 DS3's in 40 MHz were required, it would be difficult or impossible to coordinate a 3 DS3 radio in approximately half the metropolitan areas in the U.S. (i.e., the areas using the PJ Plan). The Joint Commenters may be unaware of this problem since they do not manufacture wideband 3 DS3 radios.

The highest capacity 11 GHz radio available is a 3 DS3 radio. No manufacturer produces a 4 DS3 radio.

4.3 NARROW BAND CHANNELS

The Compromise Plan includes the spectrum efficiency requirements proposed by the Joint Commenters for 3.75, 2.5, and 1.25 MHz bandwidths. For 800 and 400 KHz bandwidths, the Compromise Plan includes the spectrum efficiency requirements from the Alcatel Modified Plan.

Due to the narrow bandwidths, very high system gains are possible in low capacity 800 and 400 KHz radios, resulting in improved path reliability. For example, an 800 KHz radio carrying 2 DS1's has approximately the same system gain as a 2.5 MHz radio carrying 4 DS1's. For this reason, higher spectrum efficiency can be implemented in low capacity radios without affecting the path reliablity.

4.4 CONCATENATED CHANNELS

The Compromise Plan allows several channels to be concatenated into a wider channel. This capability is important for these reasons: it allows 2.5 MHz interstitial channels to be coordinated in the upper 6 GHz private band, it allows 20 MHz channels to be defined in the 6 and 11 GHz common carrier bands, it allows frequency coordination problems to be solved in the point-to-point section of the 10 Ghz band, and it it provides a more cost effective upgrade method for digital radios.

The Joint Commenters oppose concatenation, claiming that it would result in an unacceptably large number of different channel bandwidths.[25] Alcatel agrees that the concatenation of unequal channel bandwidths would result in many bandwidth combinations. For this reason the Compromise Plan proposes that all channels to be concatenated must have equal bandwidths (i.e., 2 x 1.25 MHz, 3 x 1.25 MHz, 2 x 10 MHz). This restriction will eliminate the odd bandwidth combinations opposed by the Joint Commenters.

4.5 TRANSITION PERIOD

The Compromise Plan proposes that all channel plans and rule changes become effective immediately, except for the minimum payload and traffic loading requirements. These requirements would be phased in after a 2 year transition period, allowing manufacturers time to make the design changes necessary to meet

5. CONCLUSION

The Compromise Plan meets or exceeds all the benchmarks that the Joint Commenters, in their April 28, 1993, ex parte filing, claim are essential for any channel plan.[26] These benchmarks are:

* BETTER PATH RELIABILITY - The Compromise Plan adopts the 3.75, 2.5, and 1.25 MHz channel bandwidths and spectrum efficiency requirements from the Joint Commenter Plan. As a result, less complex modems can be used, improving path reliability. The Compromise Plan also allows less complex modems to be used in 2 DS3 wideband radios, improving path reliability.

* LOWER COST SYSTEMS - System upgrades will be less costly under the Compromise Plan. The Joint Commenter Plan requires expensive 128 QAM and 256 QAM modems to be used to upgrade system capacity. The Compromise Plan permits the use of concatenated channels, allowing less complex modems to be used in system upgrades, thereby reducing the cost to the microwave user.

* BROADER SELECTION OF EQUIPMENT - The Compromise Plan makes specific provision for low capacity analog radios employing 800 and 400 KHz bandwidths in the lower 6 GHz, upper 6 GHz, and 10.5 GHz bands. The Joint Commenter Plan does not.

* IMPROVED SPECTRUM UTILIZATION - The Compromise Plan corrects a number of serious technical problems in the Joint Commenter Plan, including: satellite interference in the 4 GHz band, leaving vacant spectrum in the 6 and 11 GHz bands, 3.75 MHz channels overlapping multiple 5 and 10 MHz channels in various bands, and inconsistent frequency pairings. The Compromise Plan also provides additional narrow band 800 and 400 KHz channels that do not block wideband channels. Thus, adoption of the Compromise Plan would improve overall spectrum utilization.

* LESS EQUIPMENT OBSOLETED - The Compromise Plan spectrum efficiency requirements generally maintain the status quo in most bands. Therefore, most existing equipment will be unaffected by the new requirements. However, some equipment would be obsoleted after the proposed 2 year transition period.

  Alcatel manufactures 5 radios that do not meet the proposed spectrum efficiency requirements. Harris Farinon manufactures an 8 DS1 radio in the 6 GHz band and several low capacity 1 and 2 DS1 radios that do not meet the new requirements. Digital Microwave Corporation manufacturers 8 and 16 DS1 radios that would be obsoleted. Telesciences manufactures an 8 QAM version of its 4 DS1 radio that does not meet the spectrum efficiency requirements.[27] Therefore, all major microwave manufacturers would be similarly affected by the proposed spectrum efficiency requirements.

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27. Alcatel Modified Plan, Figures 21 and 22.

ADDENDUM

In ex parte comments filed on April 30, 1993, the Joint Commenters again question whether Alcatel is a U.S. company.[1]

Alcatel Network Systems, Inc., is a Delaware corporation with 4000 U.S. employees and $500 million in annual sales. Major manufacturing facilities are located in:

- Richardson, Texas
- Longview, Texas
- Raleigh, North Carolina
- San Jose, California

Alcatel has one of the broadest microwave product lines in the industry. The following is a list of microwave radios manufactured by Alcatel. All of these radios were designed in Richardson, Texas, and are manufactured in Longview, Texas.

MDR-3118	MDR-4106	MDR-5102
MDR-3218	MDR-4206	MDR-5202
MDR-3418	MDR-4306	MDR-5302
MDR-4102	MDR-4108	MDR-5402
MDR-4104	MDR-4208	MDR-5106
MDR-4204	MDR-4308	MDR-5206
MDR-4105	MDR-4111	MDR-5306
MDR-4205	MDR-4211	MDR-5111
MDR-4305	MDR-4311	

The following radios were designed by Telettra in Milan, Italy, and Digital Switch Corporation ("DSC") in Plano, Texas, as part of a joint venture. These radios are now manufactured by Alcatel in Longview, Texas. Under the Compromise Plan, these radios would be obsoleted.

DTR2-13	DTR6-13
DTR2-26	DTR6-26

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1. Ex Parte Notice, dated April 30, 1993. in ET Docket No. 92-9, filed by Telesciences, Inc., Harris Corporation-Farinon Division, and Digital Microwave Corporation.

TECHNICAL CERTIFICATION

I am an engineer by training with over 15 years of experience in the design of microwave equipment or systems. I am familiar with the Commission's existing and proposed technical rules for microwave equipment operating in the 2, 4, 6, 10, and 11 GHz frequency bands. The engineering and technical information and representations contained in these Ex Parte supplemental comments, including all attachments and appendices, was prepared or compiled by me or under my supervision. I have reviewed this Ex Parte submission and certify that the engineering and technical information and representations contained therein are true, complete, and accurate to the best of my knowledge.

Bill Knight Date: 5-17-93

Bill Knight
Transmission Engineer
Commercial & Government Systems Division

Dennis J. Guill Date: 5-17-93

Dennis Guill
Product Manager
Microwave Product Management

George Kizer Date: 5-17-93

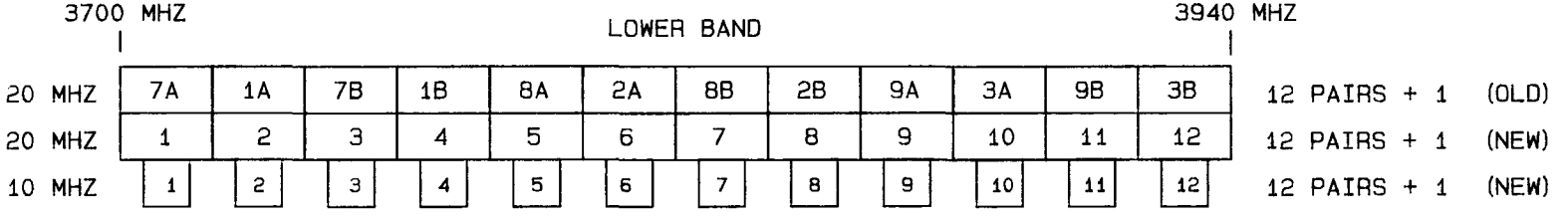
George Kizer
Product Manager
Microwave Product Management

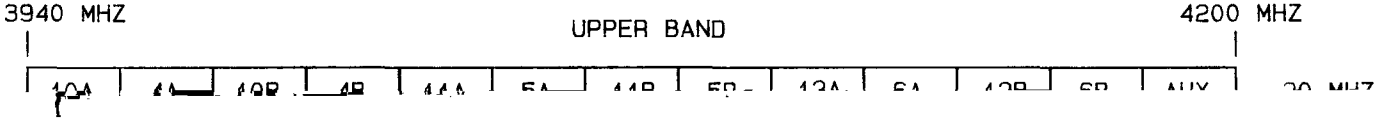
Phil Salas Date: 5/17/93

Phil Salas
Senior Director
Microwave Product Development

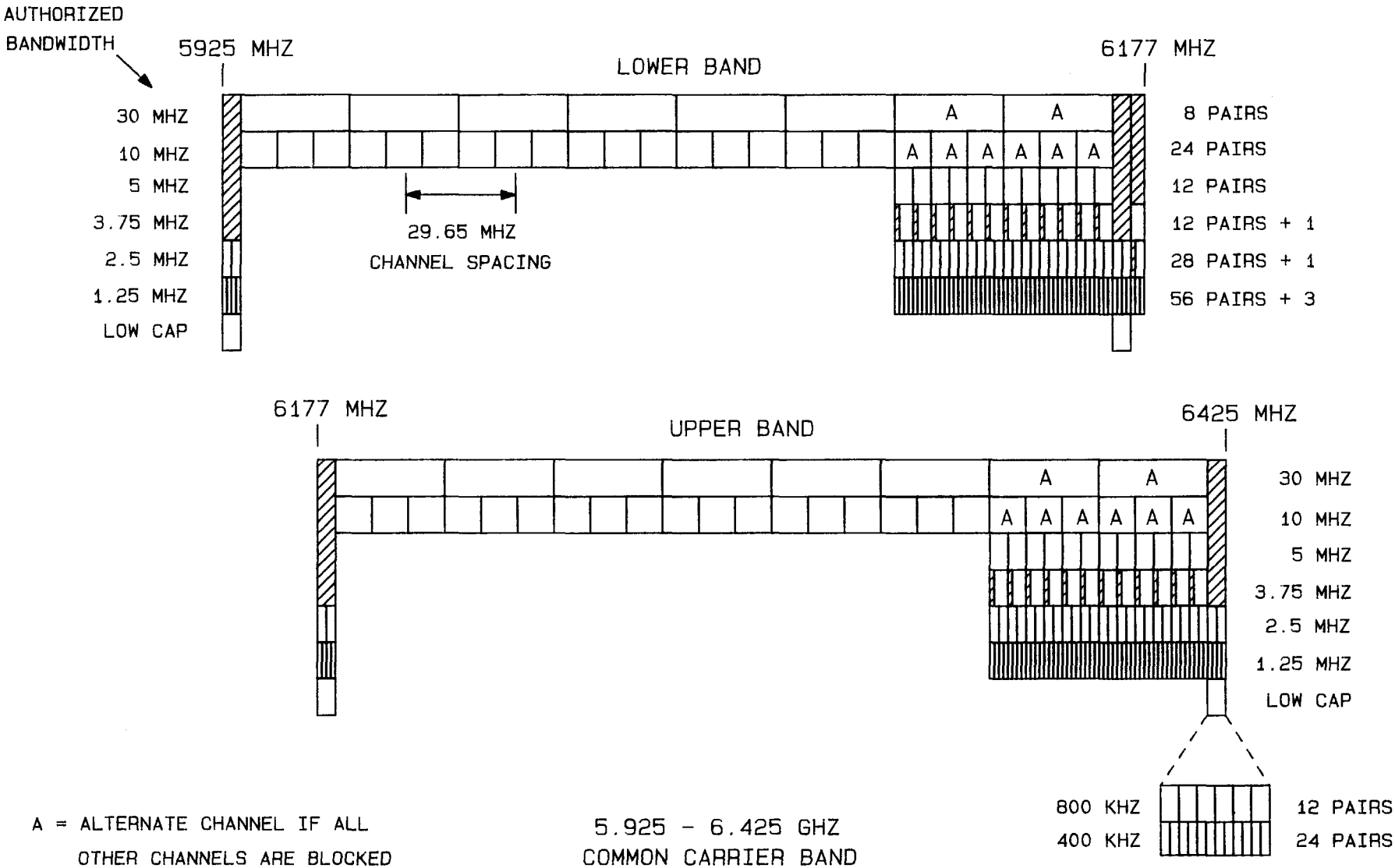
Alcatel Network Systems, Inc.
1225 North Alma Road
Richardson, Texas 75081

COMPROMISE CHANNEL PLAN – 4 GHZ BAND





COMPROMISE CHANNEL PLAN – LOWER 6 GHZ BAND

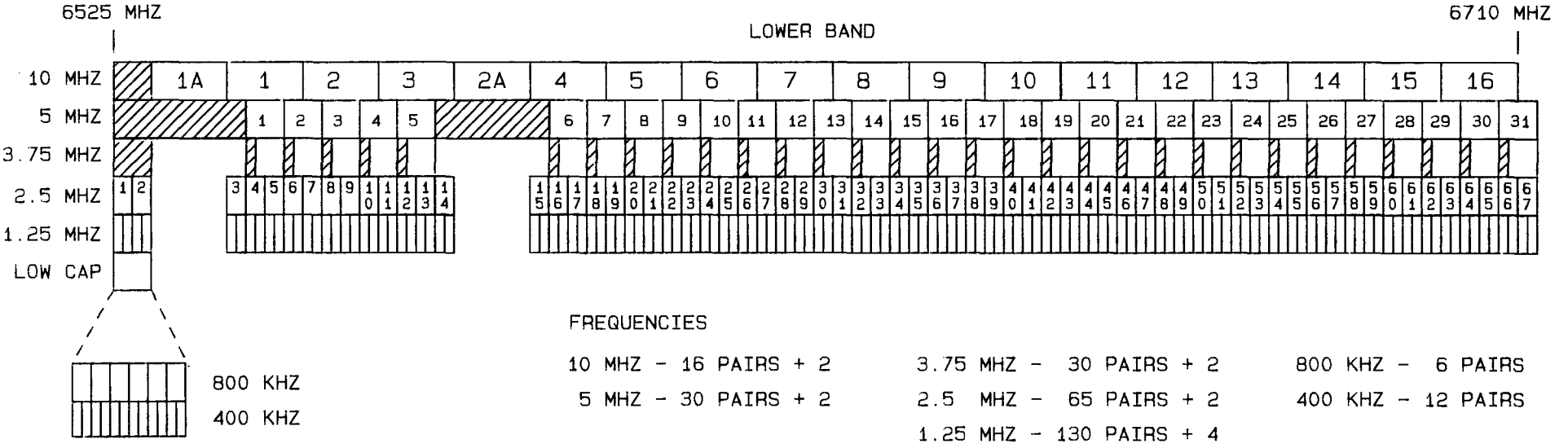


A = ALTERNATE CHANNEL IF ALL OTHER CHANNELS ARE BLOCKED

5.925 – 6.425 GHZ
COMMON CARRIER BAND
FREQUENCY CHANNELIZATION

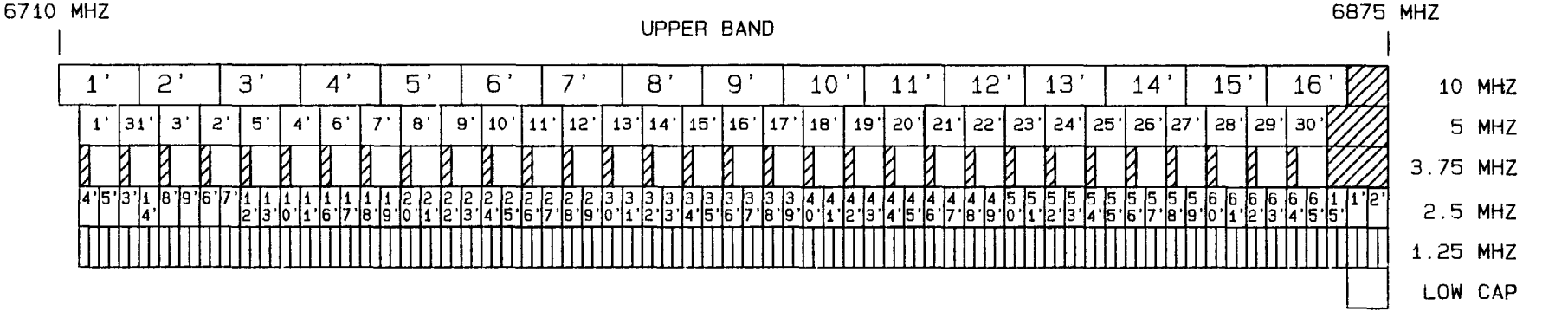
Figure 2

COMPROMISE CHANNEL PLAN – UPPER 6 GHZ BAND



FREQUENCIES

10 MHZ – 16 PAIRS + 2
5 MHZ – 30 PAIRS + 2
3.75 MHZ – 30 PAIRS + 2
2.5 MHZ – 65 PAIRS + 2
1.25 MHZ – 130 PAIRS + 4
800 KHZ – 6 PAIRS
400 KHZ – 12 PAIRS

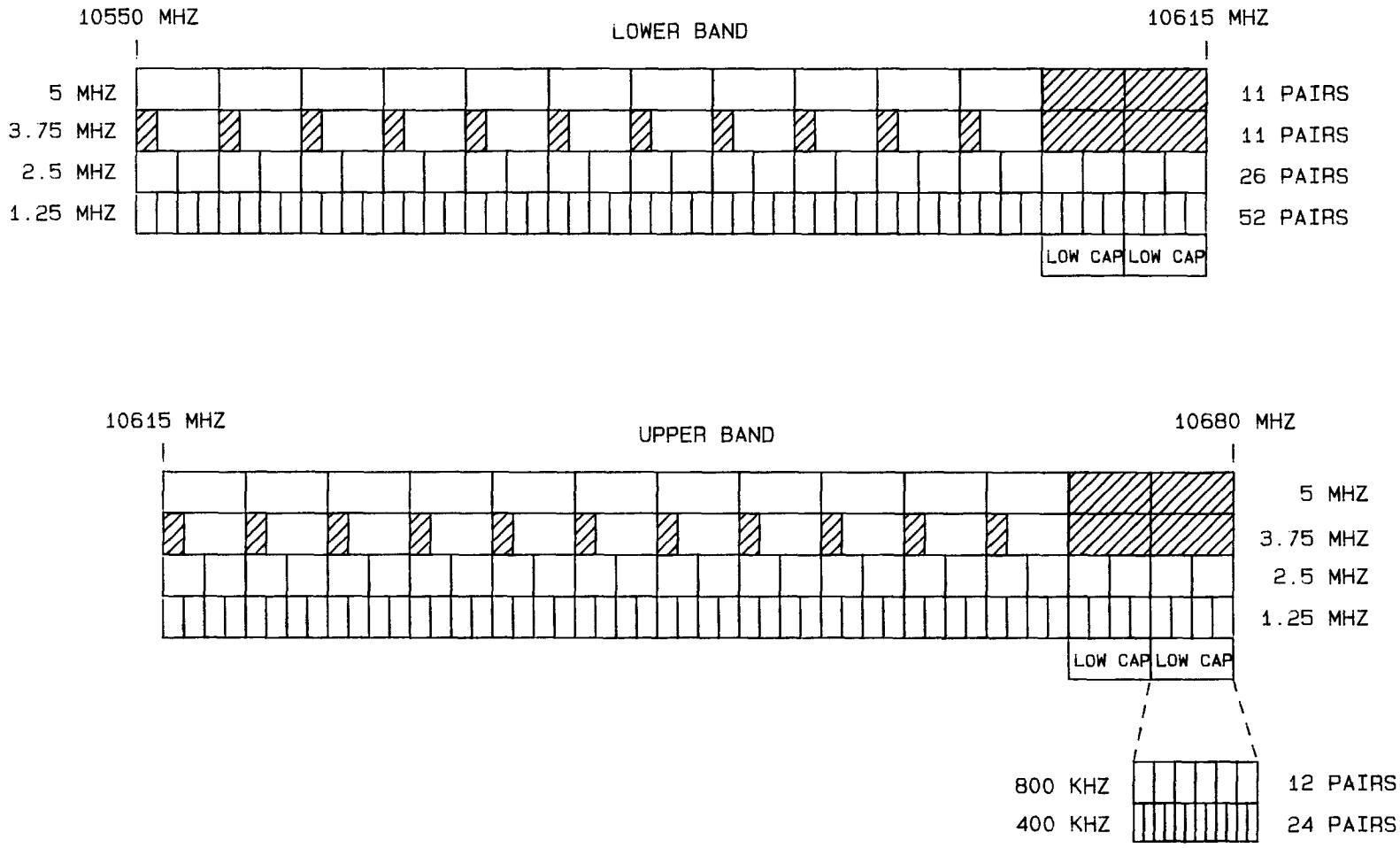


NOTE:
1. 10 MHZ CHANNELS 1 AND 1', 2 AND 2' AVAILABLE FOR UNPAIRED USE
2. 5 MHZ CHANNELS 1 AND 1', 3 AND 3', 31 AND 31' FOR UNPAIRED USE
3. 10 MHZ CHANNELS 1A AND 2A FOR EMERGENCY RESTORATION

6.525 – 6.875 GHZ
PRIVATE OPERATIONAL FIXED
FREQUENCY CHANNELIZATION

Figure 3

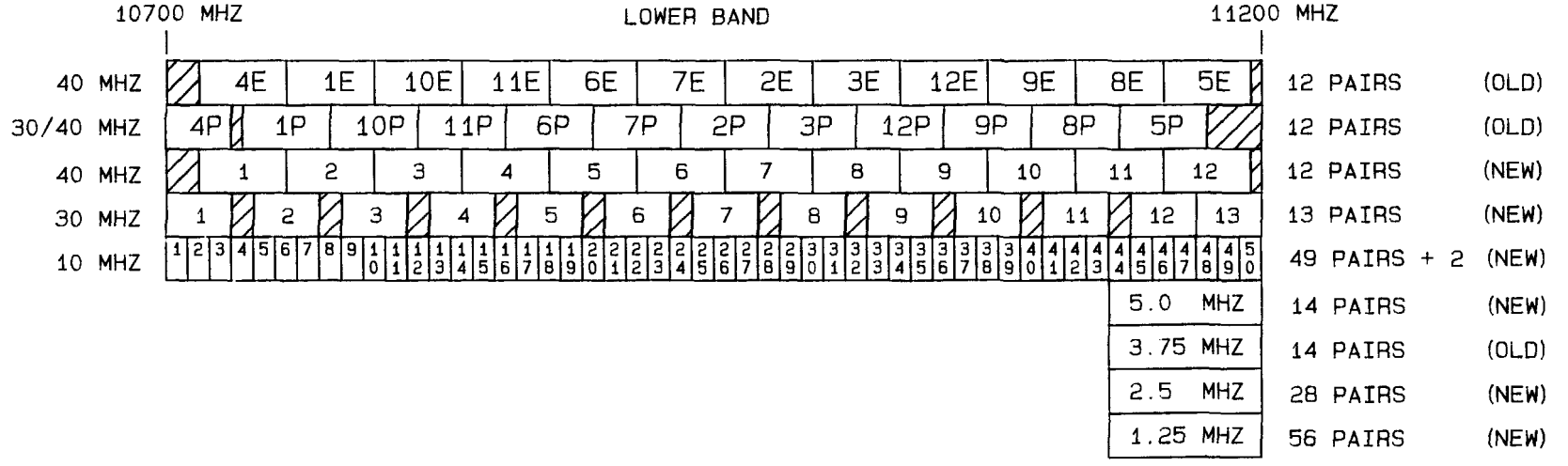
COMPROMISE CHANNEL PLAN – 10 GHZ BAND

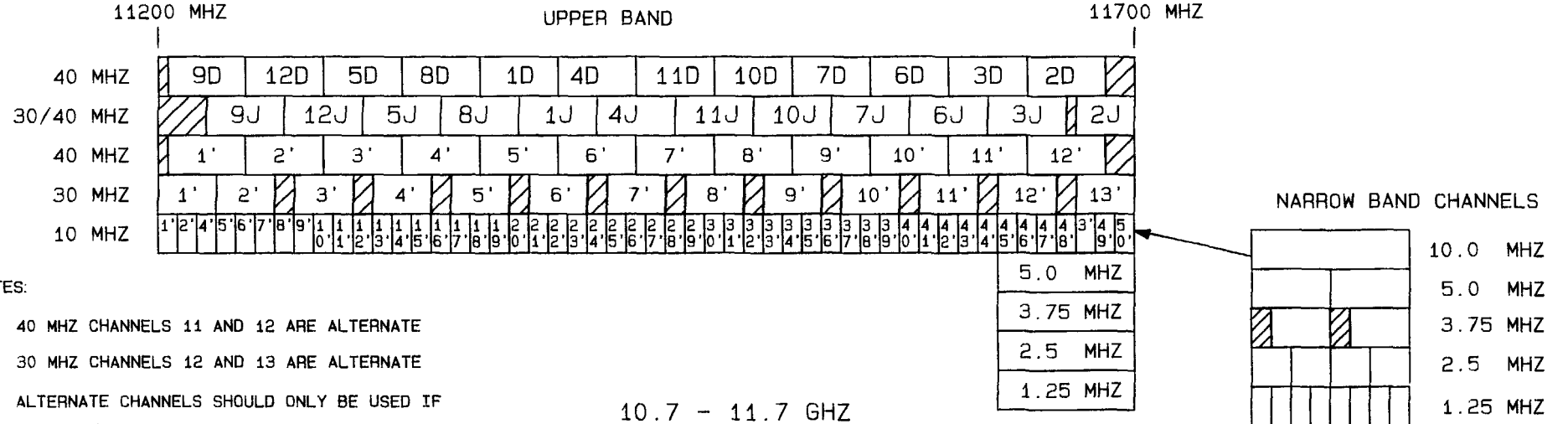


10.55 - 10.68 GHZ
FREQUENCY CHANNELIZATION

Figure 4

COMPROMISE CHANNEL PLAN – 11 GHZ BAND





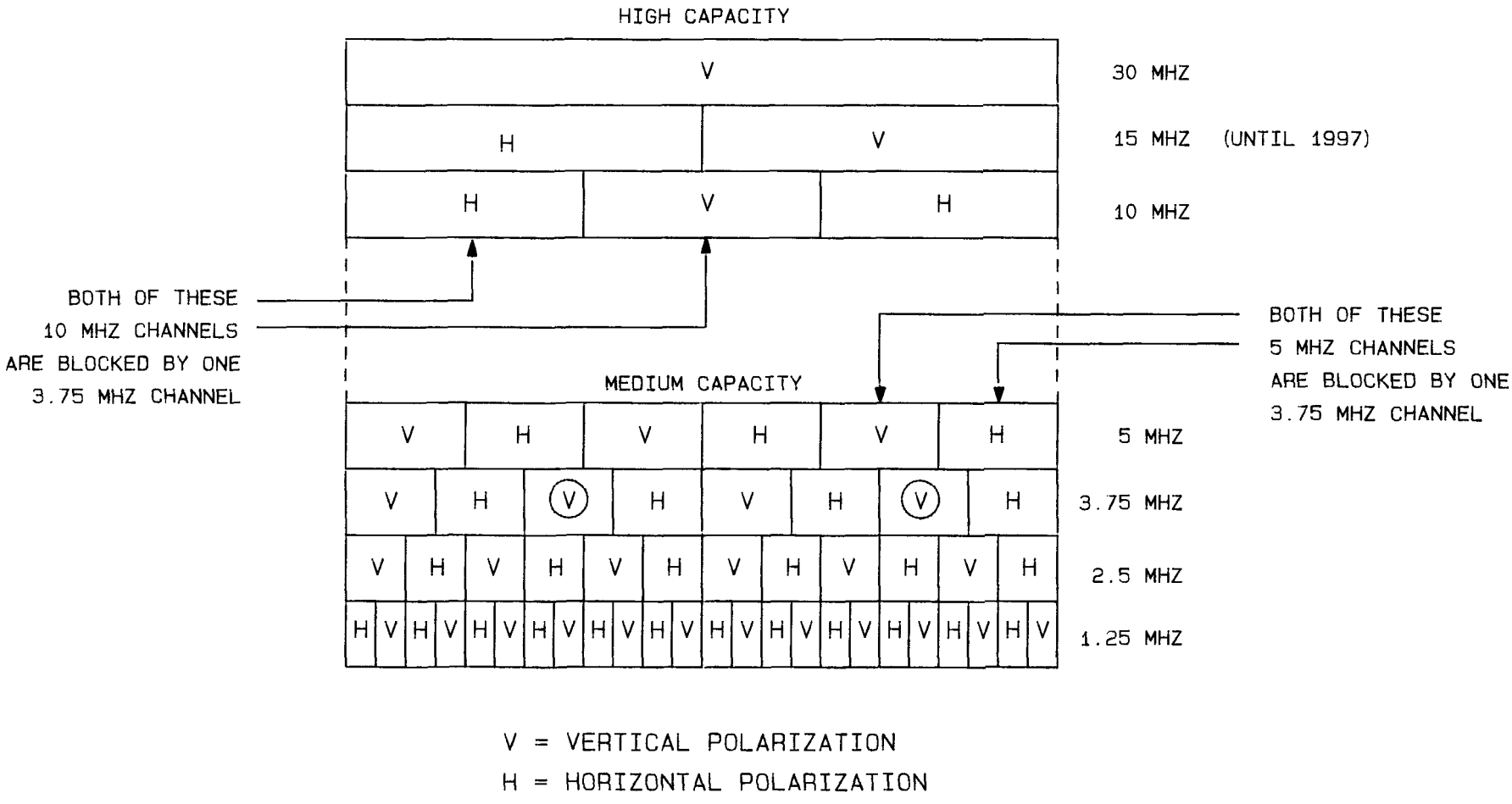
NOTES:

1. 40 MHZ CHANNELS 11 AND 12 ARE ALTERNATE
2. 30 MHZ CHANNELS 12 AND 13 ARE ALTERNATE
3. ALTERNATE CHANNELS SHOULD ONLY BE USED IF ALL OTHER CHANNELS ARE BLOCKED
4. 10 MHZ CHANNELS 3 AND 3' ARE UNPAIRED

10.7 – 11.7 GHZ
COMMON CARRIER BAND
FREQUENCY CHANNELIZATION

Figure 5

JOINT COMMENTER PLAN – 3.75 MHZ CHANNEL PROBLEM



V = VERTICAL POLARIZATION

H = HORIZONTAL POLARIZATION

Figure 6

COMPROMISE CHANNEL PLAN – 3.75 MHZ CHANNELS

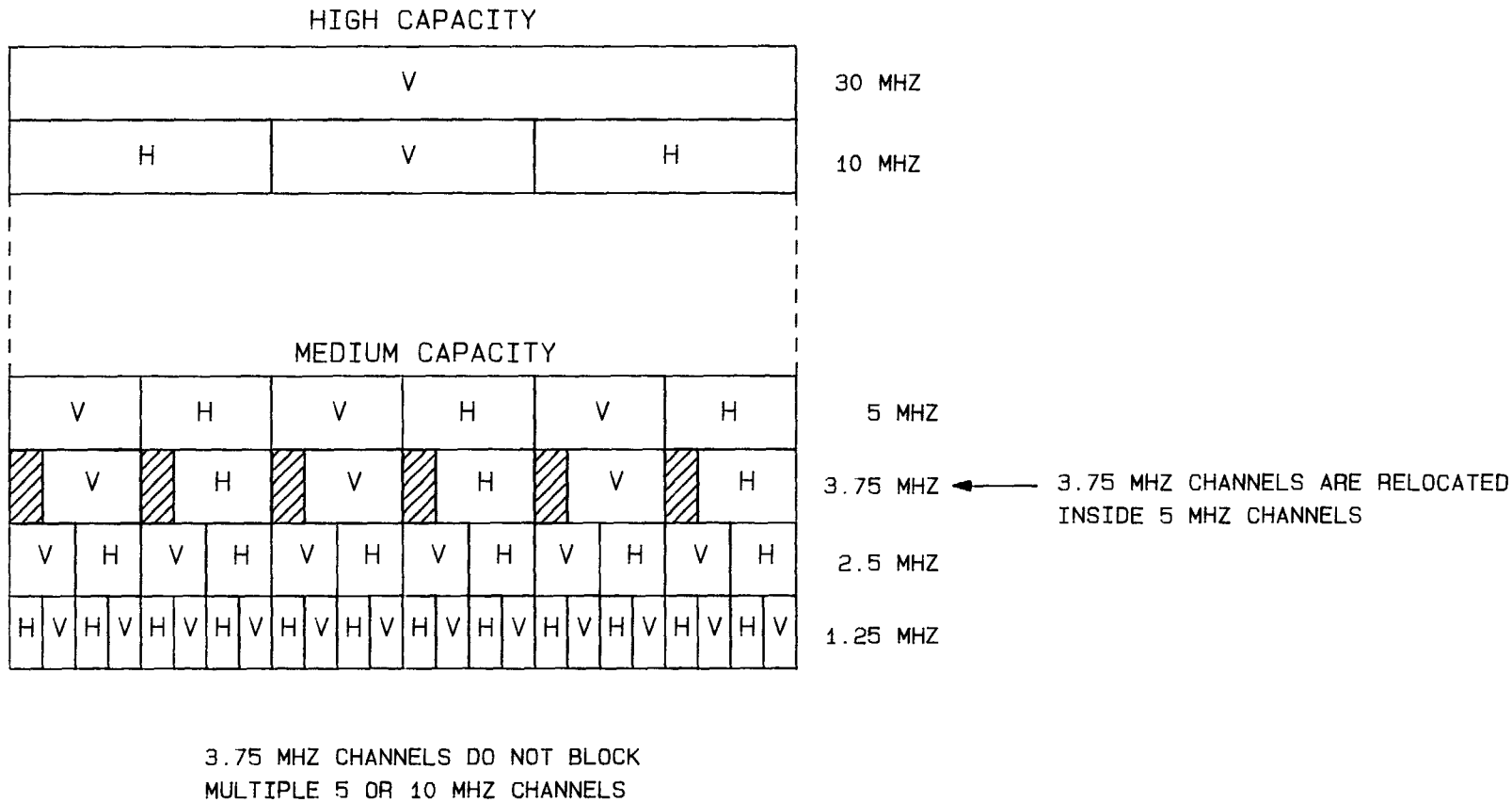
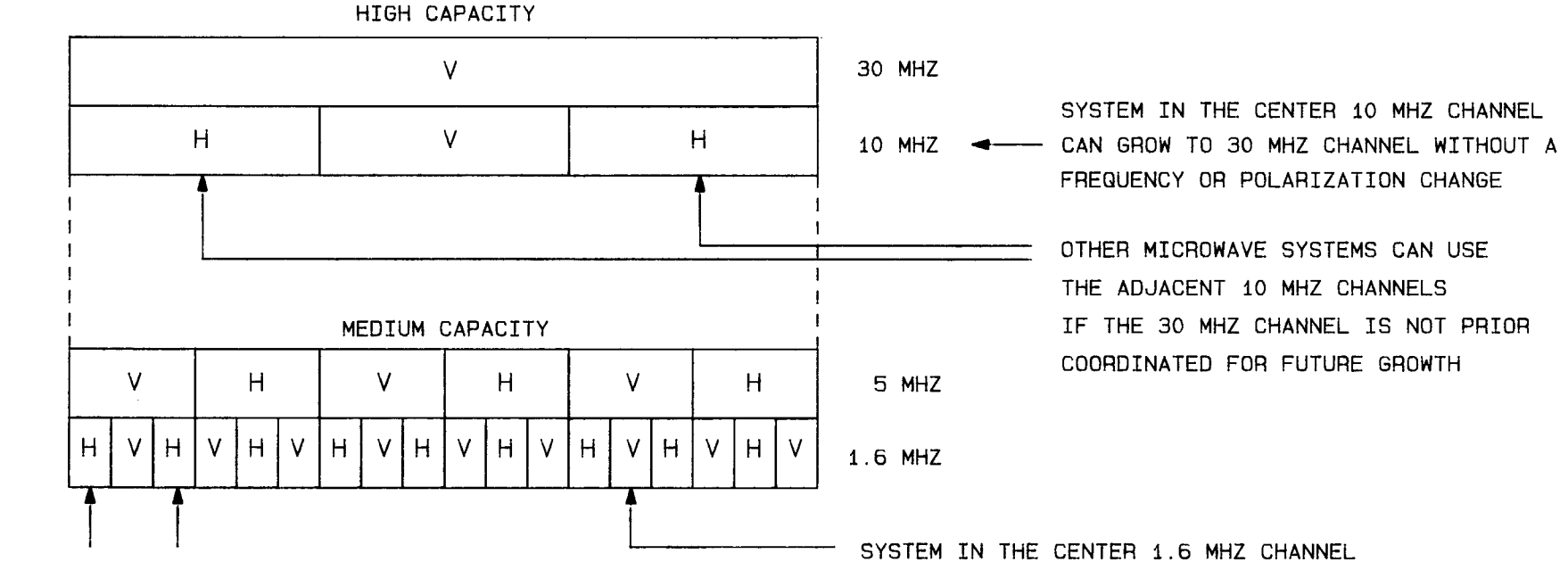


Figure 7

ALCATEL MODIFIED CHANNEL PLAN – LOWER 6 GHZ BAND

SYSTEM GROWTH PLAN



GROWTH CHANNELS CAN BE RELEASED TO
OTHER MICROWAVE SYSTEMS USING
THE LONG ESTABLISHED NSMA PROCEDURE

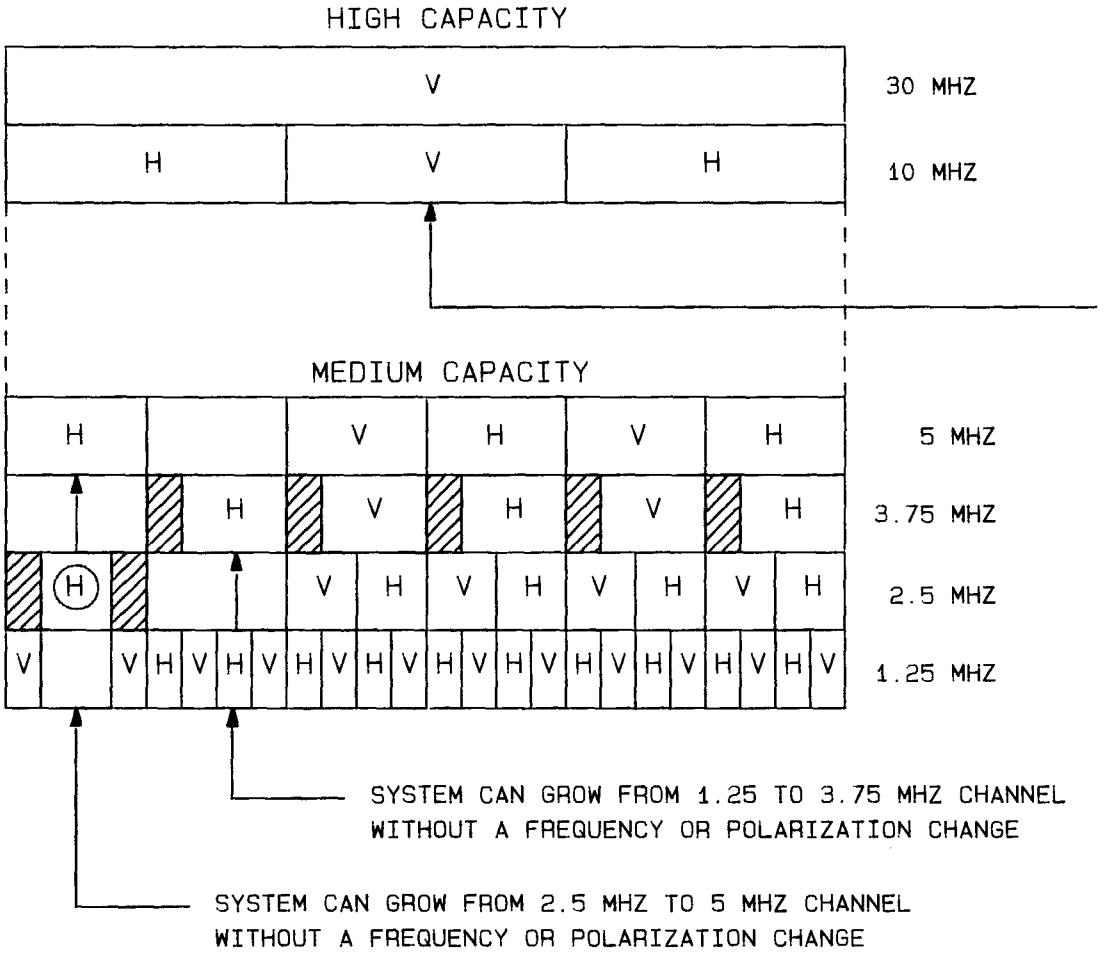
V = VERTICAL POLARIZATION

H = HORIZONTAL POLARIZATION

Figure 8

COMPROMISE CHANNEL PLAN – LOWER 6 GHZ BAND

SYSTEM GROWTH PLAN



V = VERTICAL POLARIZATION

H = HORIZONTAL POLARIZATION

NOTE:

1. CIRCLED CHANNEL IS A 2.5 MHZ CONCATENATED CHANNEL (2 x 1.25 MHZ)

Figure 9

JOINT COMMENTER PLAN – UPPER 6 GHZ PROBLEMS

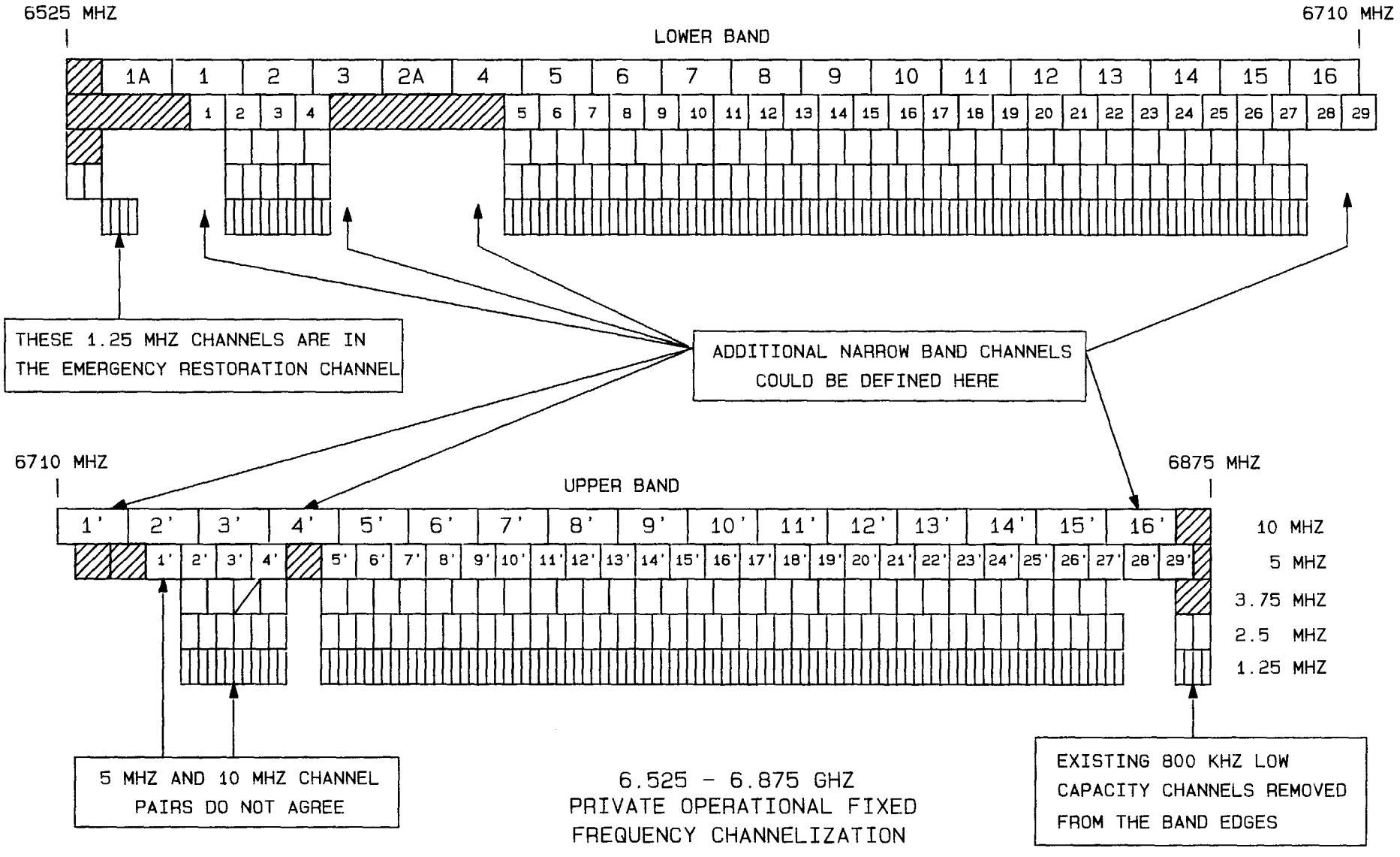


Figure 10

REVISED JOINT COMMENTER PLAN – UPPER 6 GHZ BAND

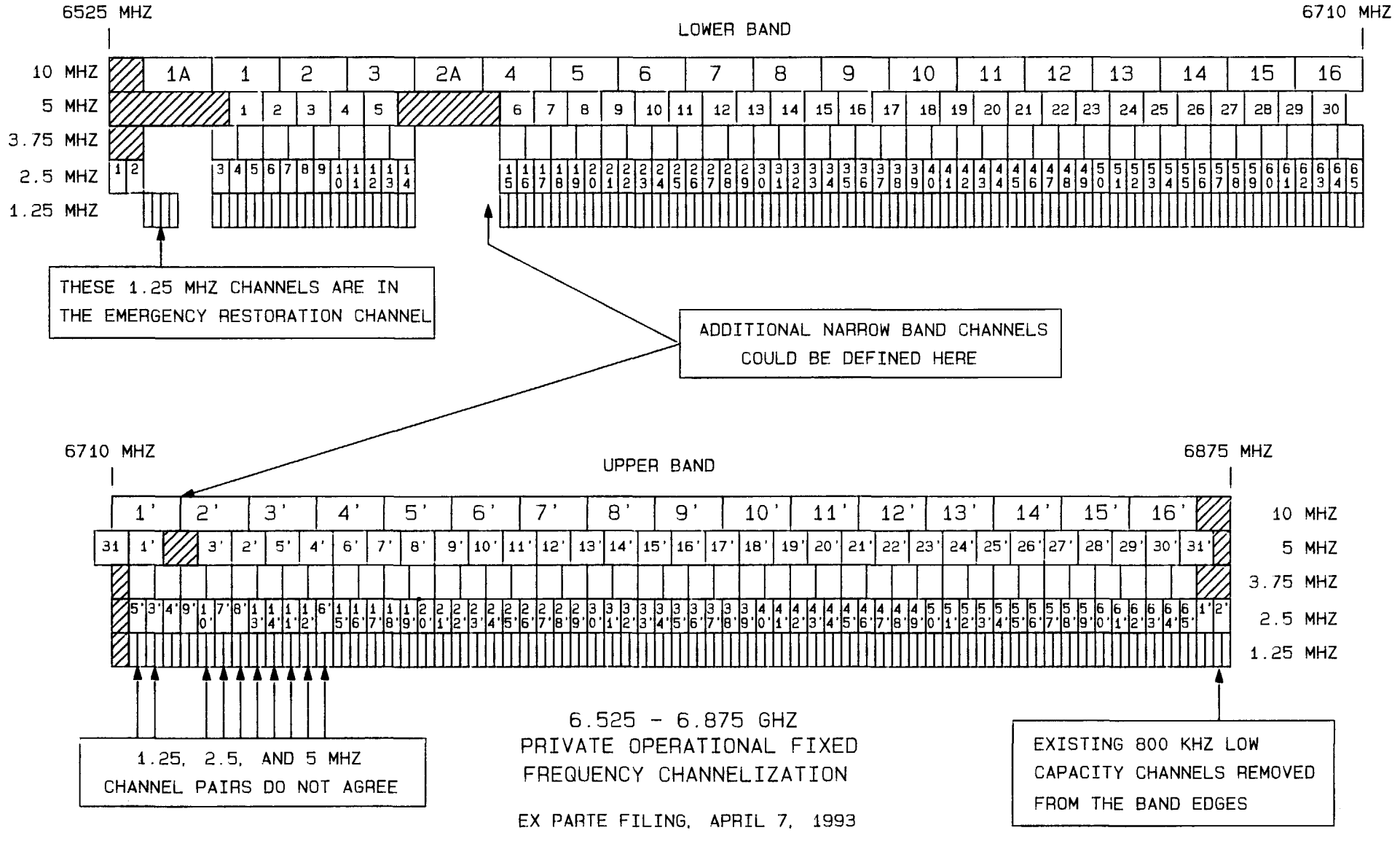
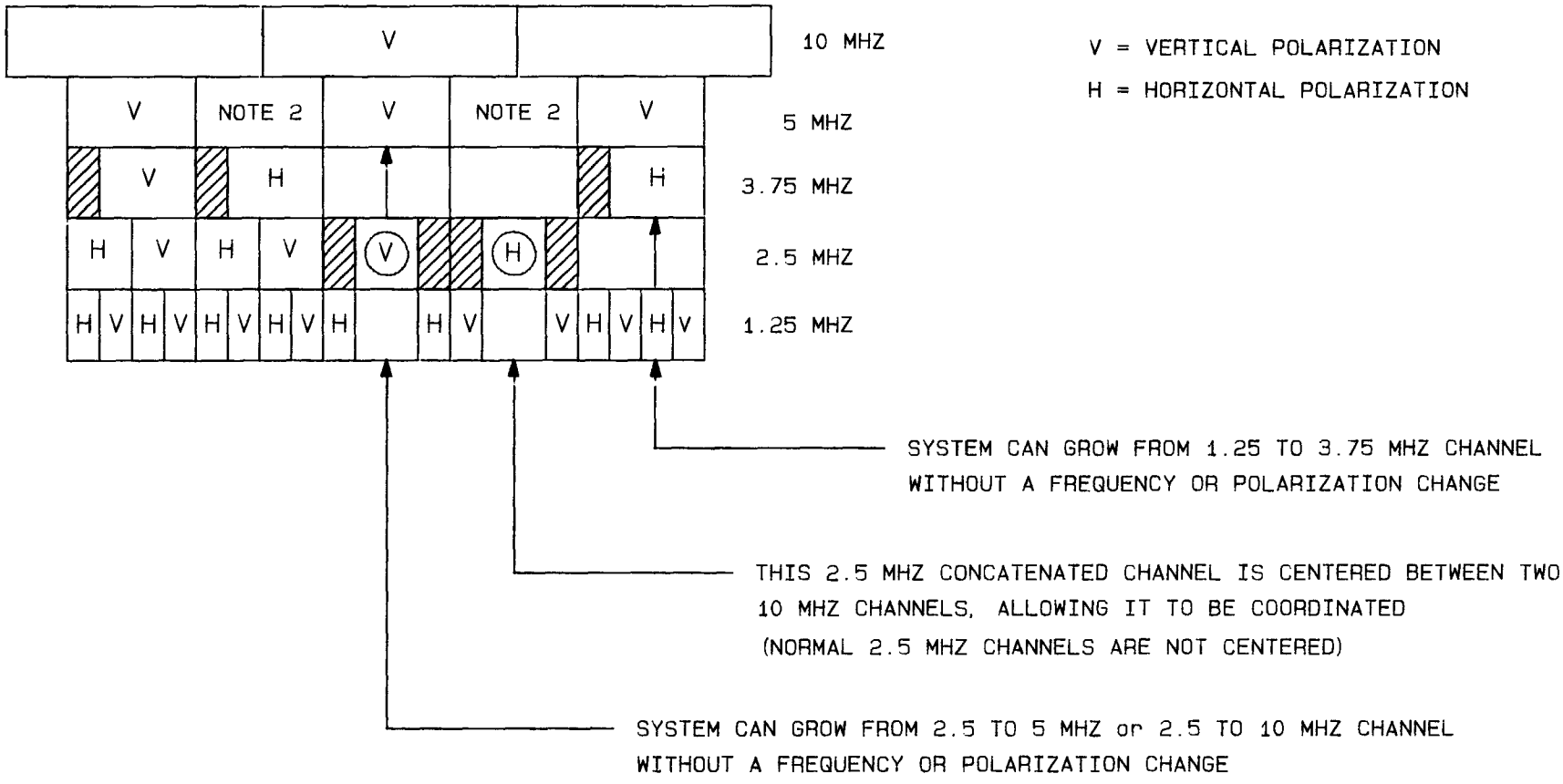


Figure 11

COMPROMISE CHANNEL PLAN – UPPER 6 GHZ BAND

SYSTEM GROWTH PLAN



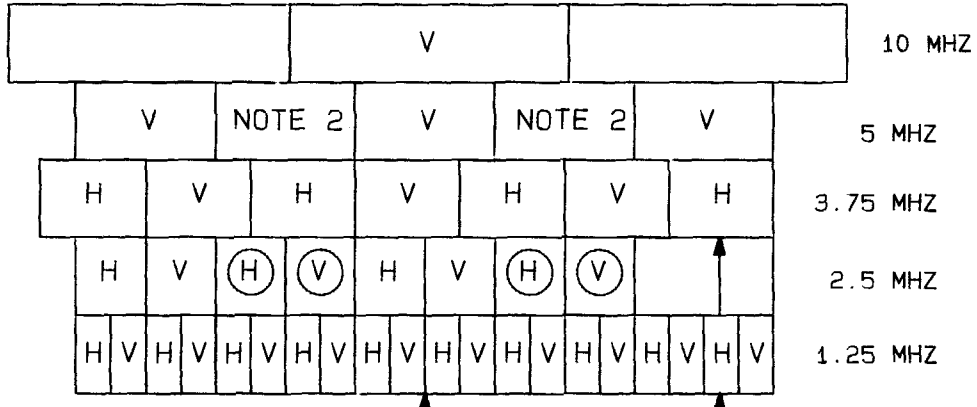
NOTE:

1. CIRCLED CHANNELS ARE 2.5 MHZ CONCATENATED CHANNELS (2 x 1.25 MHZ)
2. 5.0 MHZ INTERSTITIAL CHANNEL

Figure 12

JOINT COMMENTER PLAN – UPPER 6 GHZ BAND

SYSTEM GROWTH PLAN



V = VERTICAL POLARIZATION

H = HORIZONTAL POLARIZATION

SYSTEM CAN GROW FROM 1.25 TO 3.75 MHZ CHANNEL
WITHOUT A FREQUENCY OR POLARIZATION CHANGE

SYSTEM CAN GROW FROM 5 MHZ to 10 MHZ CHANNEL
WITHOUT A FREQUENCY OR POLARIZATION CHANGE

NOTE:

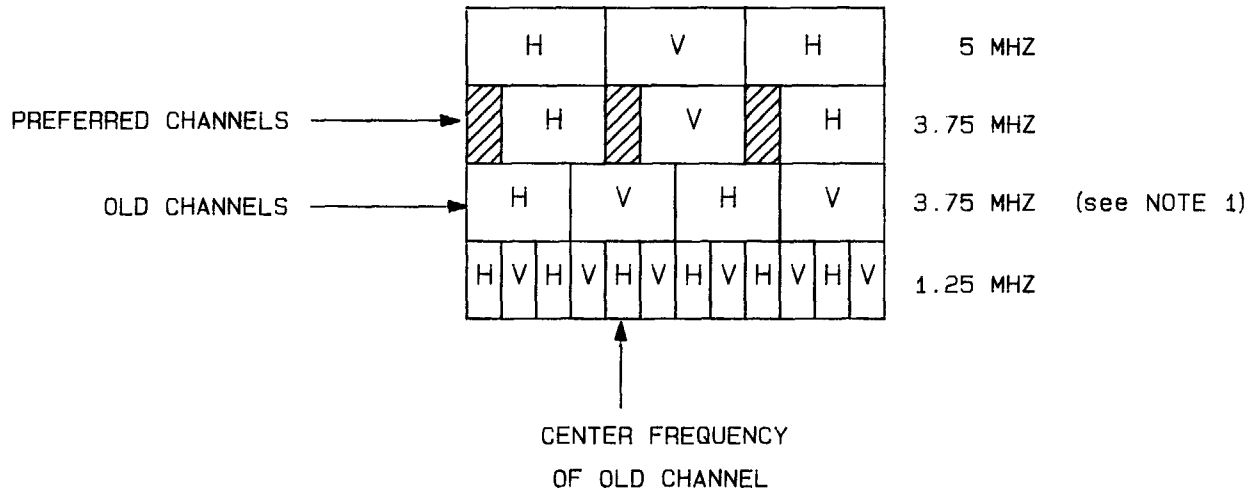
1. CIRCLED 2.5 MHZ CHANNELS ARE DIFFICULT TO COORDINATE BECAUSE THEY ARE NOT CENTERED BETWEEN 10 MHZ CHANNELS

2. 5.0 MHZ INTERSTITIAL CHANNEL

Figure 13

COMPROMISE CHANNEL PLAN – 10 GHZ BAND

3.75 MHZ CHANNELS IN THE POINT-TO-POINT SECTION



- PREFERRED 3.75 MHZ CHANNELS DO NOT OVERLAP MULTIPLE 5 MHZ CHANNELS

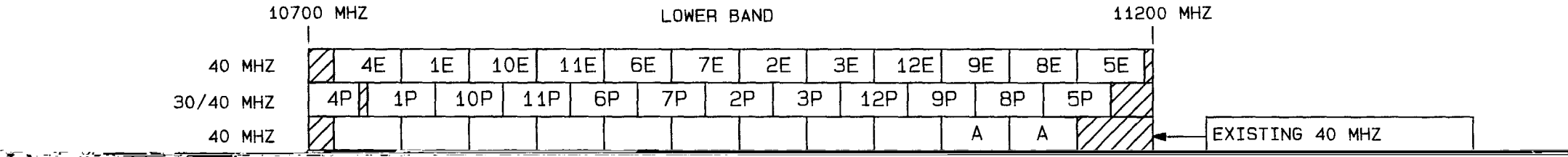
- OLD 3.75 MHZ CHANNELS CAN BE USED IF REQUIRED
  (3 x 1.25 MHZ CONCATENATED FREQUENCY)

NOTE:

1. 3.75 MHZ CONCATENATED CHANNEL (3 x 1.25 MHZ)

Figure 14

JOINT COMMENTER PLAN – 11 GHZ PROBLEMS



APPENDIX A

COMPROMISE CHANNEL PLAN

LIST OF CENTER FREQUENCIES

3.7 - 4.2 GHZ COMMON CARRIER BAND

(1) 20 MHZ BANDWIDTH CHANNELS

TRANSMIT (receive) (MHZ)	RECEIVE (transmit) (MHZ)	
3710	3990	
3730	4010	
3750	3950	
3770	3970	
3790	4070	
3810	4090	
3830	4030	
3850	4050	
3870	4150	
3890	4170	
3910	4110	
3930	4130	
n/a	4190	1

1 - These frequencies may be assigned for unpaired use.

(2) 10 MHZ BANDWIDTH CHANNELS

TRANSMIT (receive) (MHZ)	RECEIVE (transmit) (MHZ)	
3710	3990	
3730	4010	
3750	3950	
3770	3970	
3790	4070	
3810	4090	
3830	4030	
3850	4050	
3870	4150	
3890	4170	
3910	4110	
3930	4130	
n/a	4190	1

1 - These frequencies may be assigned for unpaired use.